IMPACT OF URBAN AIR POLLUTION ON INCIDENCE AND PROGNOSIS OF STROKE

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Background and aims: Few studies have evaluated the association between long-term exposure to air pollution and incidence or prognosis of stroke. We investigated the association between nitrogen dioxide (NO_2) exposure at residence and incidence of stroke (total and by subtype) and its prognosis within a large cohort study.
Methods: The Rome Longitudinal Study (RoLS) is a fixed cohort enrolled at the 2001 census. We selected subjects aged 45-80 years at the baseline who had not changed their address nor had a hospital admission for stroke in the previous five years (n=677,909). Incident cases of stroke occurred between October 2001 and December 2004 were selected from administrative databases. NO_2 exposure was estimated for residence's coordinates through a land use regression model (R^2=0.66). Subjects were followed till December 31st, 2006. We used Cox regression models to evaluate the association between NO_2 exposure and incidence of stroke and survival taking account of education, occupation, place of birth, and area-based socioeconomic position (SEP).
Results: During the period 2001-2004 there were 4455 new cases of stroke (76% ischemic) in the cohort . Average exposure of NO_2 was 44 (sd 8) $\mu g/m^3$. There was no evidence of association between NO_2 at residence and incidence of stroke in the study population, both for ischemic and hemorrhagic forms. Stroke incident cases in the highest quintile of exposure (>50.2$\mu g/m^3$) had 23% (95%CI:3%-47%) risk of dying for natural causes than those living in the lowest quintile (<35.7$\mu g/m^3$). After first stroke there was a 9% (95%CI:3%-17%) higher risk of dying for 10$\mu g/m^3$ increase of NO_2 at residence.
Conclusions: Although there was no evident association between air pollution exposure at residence and incidence of stroke, we found a strong evidence of association between NO_2 exposure and survival after first stroke.